

What is claimed is:

1. A casting machine furnace apparatus comprising:
 - a furnace adapted to receive molten metal, said furnace including an outer wall structure;
 - a cover adapted to seal the furnace;
 - a source of fluid, said fluid being supplied into said furnace for applying fluid pressure on said molten metal; and
 - a casting apparatus in fluid communication with said molten metal such that application of said fluid pressure on said molten metal causes said molten metal to supply said casting apparatus;
- wherein said outer wall structure of said furnace is provided with a plurality of exhaust ports, said exhaust ports being provided in said outer wall structure at predetermined locations and selectively controllable between a first closed position, wherein said exhaust ports do not allow air to be exhausted from said furnace, and a second opened position, wherein said exhaust ports enable air to be exhausted from said furnace.

2. The casting machine furnace apparatus according to Claim 1 wherein said outer wall structure of said furnace is provided with a plurality of air pockets, wherein a respective one of said plurality of air pockets is located directly adjacent a respective one of said exhaust ports so as to provide a fluid path from an interior chamber of said furnace, to said plurality of air pockets, and to said plurality of exhaust ports.

25

3. The casting machine furnace apparatus according to Claim 1 wherein said outer wall structure of said furnace includes at least an outer wall

and an inner insulating layer, said outer wall having an inner wall surface, and wherein said plurality of pockets are formed in said insulating layer directly adjacent said inner wall surface of said outer wall.

5 4. The casting machine furnace apparatus according to Claim 1 wherein said outer wall structure includes at least an outer wall, an inner insulating layer, and an intermediate fluid chamber layer disposed between said outer wall and said inner insulating layer, said intermediate fluid chamber layer including at least a paper layer.

10 5. The casting machine furnace apparatus according to Claim 4 wherein said intermediate fluid chamber layer further includes a metal grid layer interposed between said paper layer and said outer wall.

15 6. The casting machine furnace apparatus according to Claim 4 wherein said intermediate fluid chamber layer is more permeable than said inner insulating layer.

7. 7. The casting machine furnace apparatus according to Claim 1
20 wherein said outer wall structure of said furnace includes an outer wall having an inner wall surface, a fluid chamber layer disposed adjacent said inner wall surface of said outer wall, an insulating layer disposed adjacent said fluid chamber layer, and an inner liner layer disposed adjacent said insulating layer, said intermediate fluid chamber layer including at least a paper layer.

25 8. The casting machine furnace apparatus according to Claim 7 wherein said fluid chamber layer further includes a metal grid layer interposed between said inner wall surface of said outer wall and said paper layer.

9. The casting machine furnace apparatus according to Claim 7 wherein said fluid chamber layer is more permeable than said insulating layer and said insulating layer is more permeable than said inner liner layer.

5

10. The casting machine furnace apparatus according to Claim 1 wherein

11. The casting machine furnace apparatus according to Claim 1
10 wherein said plurality of exhaust ports includes at least one exhaust port positioned above a level of said molten metal in said furnace and at least one exhaust ports positioned below said level of said molten metal in said furnace.

12. A casting machine furnace apparatus comprising:
15 a furnace adapted to receive molten metal, said furnace including an outer wall structure, said outer wall structure provided with a plurality of exhaust ports, said exhaust ports being provided in said outer wall structure at predetermined locations and selectively controllable between a first closed position, wherein said exhaust ports do not allow air to be exhausted from said 20 furnace, and a second opened position, wherein said exhaust ports enable air to be exhausted from said furnace;

wherein said outer wall structure of said furnace is provided with a fluid chamber layer, wherein said fluid chamber layer is located directly adjacent said exhaust ports so as to provide a fluid path from an interior chamber of said 25 furnace, to said fluid chamber layer, and to said plurality of exhaust ports.

13. The casting machine furnace apparatus according to Claim 12 wherein said outer wall structure of said furnace includes at least an outer wall

and an inner insulating layer, said outer wall having an inner wall surface, and wherein said fluid chamber layer is formed in said insulating layer directly adjacent said inner wall surface of said outer wall.

5 14. The casting machine furnace apparatus according to Claim 12 wherein said outer wall structure includes at least an outer wall and an inner insulating layer, and wherein said fluid chamber layer is disposed between said outer wall and said inner insulating layer, said fluid chamber layer including at least a paper layer.

10 15. The casting machine furnace apparatus according to Claim 14 wherein said fluid chamber layer further includes a metal grid layer interposed between said paper layer and said outer wall.

15 16. The casting machine furnace apparatus according to Claim 14 wherein said fluid chamber layer is more permeable than said inner insulating layer.

20 17. The casting machine furnace apparatus according to Claim 14 wherein said fluid chamber layer is more permeable than said insulating layer and said insulating layer is more permeable than said inner liner layer.

25 18. The casting machine furnace apparatus according to Claim 12 wherein said fluid chamber layer is comprised of at least a first material and a second different material.

19. A method of venting a casting machine furnace comprising:

providing a casting machine furnace defining a furnace chamber, said casting machine furnace having at least one exhaust port;

positioning a cover on said casting machine furnace for substantially sealing said furnace chamber;

5 providing a fluid source in fluid communication with said fluid source; introducing fluid from said fluid source to pressurize the furnace

chamber;

operating said casting machine furnace to provide casting material to a casting apparatus; and

10 opening said at least one exhaust port to release a portion of said fluid contained within said furnace chamber.

20. The method defined in Claim 17 wherein said casting machine furnace further comprises an outer wall structure, wherein said outer wall 15 structure includes at least an outer wall, an inner insulating layer, and an intermediate fluid chamber layer disposed between said outer wall and said inner insulating layer, said intermediate fluid chamber layer including at least a paper layer.